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IS 14387 (2005): Vaults - Air ventilators s [MED 24: Security Equipment]

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(पहला पुनरीक्षण)

Indian Standard

VAULTS — AIR VENTILATORS — SPECIFICATION

(First Revision)

ICS 13.310

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 2005

Price Group 3

Security Equipment Sectional Committee, ME 24

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Security Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1996. The experience gained in implementation of the standard necessitated this revision. In this revision the ventilators are classified into four classes in place of earlier three classes.

The construction of air ventilators for the strong rooms and vaults, which are primarily meant to provide ventilation facility inside a vault (strong room), shall be such as will prevent direct access to the inside of vaults from outside and vice versa. This indirect access is meant to ensure preventing the spread of fire from outside of vaults to inside and thereby to prevent damage to the contents of vaults due to fire.

The composition of the Committee responsible for the formulation of this Indian Standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed and calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

VAULTS — AIR VENTILATORS — SPECIFICATION

(First Revision)

1 SCOPE

This standard lays down the requirements regarding materials, sizes and details of construction of air ventilators (which are used for ventilating vaults) so as to ensure that security is not adversely affected.

2 REFERENCES

The following standards contain provisions, which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
110 : 1983	Ready mixed paint, brushing, and grey filler, for enamels for use over primers (*first revision*)
133 : 1993	Enamel, interior : (a) undercoating (b) finishing — Specification (*third revision*)
191 (Parts 1 to 10) : 1980	Copper (*third revision*)
736 : 1986	Wrought aluminium and aluminium alloy plate for general engineering purposes (*third revision*)
737 : 1986	Wrought aluminium and aluminium alloy sheet and strip for general engineering purposes (*third revision*)
814 : 1991	Covered electrodes for manual metal arc welding of carbon and carbon manganese steel (*fifth revision*)
1079 : 1994	Hot rolled carbon steel sheets and strips — Specification (*fifth revision*)
1364 (Part 1) : 1992	Hexagonal head bolts, screws and nuts of product grades A and B: Part 1 Hexagon head bolts (size range M16 to M64) (*third revision*)
1365 : 1978	Slotted counter sunk head screws (*third revision*)
2062 : 1999	Steel for general structural purposes — Specification (*fifth revision*)
2932 : 1993	Enamel, synthetic, exterior : (a) undercoating (b) finishing (*second revision*)
5986 : 2002	Hot rolled steel flat products for structural forming and flanging purposes — Specification (*second revision*)
6126 : 1971	Nitrocellulose surfacer

3 CLASSES AND DIMENSIONS

3.1 The air ventilators shall be of 4 classes. The recommended use of different classes is given in Table 1.

3.2 Dimensions of the air ventilators for vaults shall be as specified in Table 1 read with Fig. 1.

4 MATERIALS

The different materials used for manufacture of an air ventilator shall be as specified in Table 2.

5 DESIGNATION

An air ventilator shall be designated by class and number of this Indian Standard.

> *Example:*
>
> An air ventilator of Class A with exhaust fan shall be designated as:
>
> Air ventilator Class A — IS 14387 with exhaust fan.

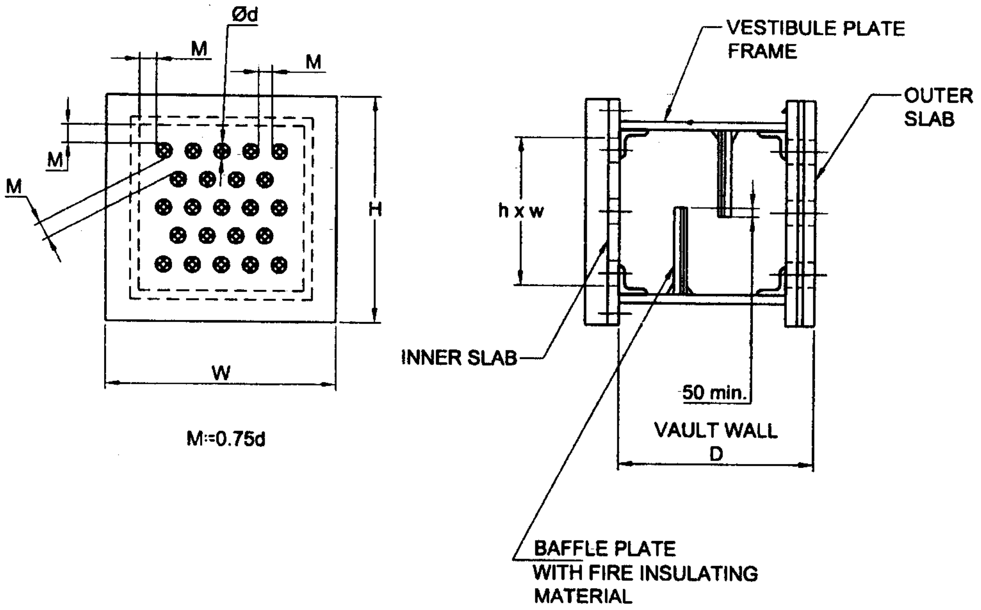
6 CONSTRUCTION

6.1 For Class B Ventilators

The outer slab shall be of combination of mild steel plates interlaced with oxyacetylene torch resisting material over the exposed surface.

6.2 For Class A, AA and AAA Ventilators

6.2.1 The outer and inner slab shall consist of outer and inner mild steel plates, minimum 5 mm thick, interlaced with a torch and drill resisting (TDR) matrix slab of thickness as specified in Table 1. The construction shall be such that TDR matrix slab is adequately anchored to



All dimensions in millimetres.

FIG. 1 TYPICAL DETAILS OF AIR VENTILATORS

Table 1 General Requirements of Air Ventilators and Their Components

(*Clauses* 3.1, 3.2, 6.2.1, 6.2.4, and *Fig.* 1)

Sl No. (1)	Description (2)	Class B (3)	A (4)	AA (5)	AAA (6)
i)	Recommended vault (Strong room) class	B	A	AA	AAA
ii)	Dimension *H*, mm, *Min*	410			
iii)	Dimension *W*, mm, *Min*	410			
iv)	Dimension *D*, mm, *Min*	300		450	600
v)	Dimension *h*, mm	300 ± 25			
vi)	Dimension *w*, mm	300 ± 25			
vii)	Thickness of outer slab, mm	22	40	50	60
viii)	Thickness of oxyacetylene torch resisting material in outer slab, mm, *Min*	5	30	40	50
ix)	Thickness of inner slab/plate, mm, *Min*	10	40	50	60
x)	Thickness of torch and drill resisting (TDR)[1] matrix in inner slab, mm	—	30	40	50
xi)	Thickness of vestibule frame, mm, *Min*	5			
xii)	Thickness of fire insulating material, mm	5			
xiii)	Burglary resistance, *Min*	20	45	90	120

[1] Torch and drill resisting material capable of resisting a combined/simultaneous attack of oxyacetylene torch and impact tool.

Table 2 Materials for Air Ventilators
(*Clause* 4)

Sl No. (1)	Part (2)	Material (3)
i)	Outer and inner plates and other mild steel components	Steel of 'any of the grades given in **4** conforming to **6** to the requirements of carbon and manganese, **7.3**, **8** and **12**' of IS 1079 or 'any of the grades given in **5** conforming to **8** to the requirements of carbon and manganese, **10.3**, **11** and **12**' of IS 2062 or 'any of the grades given in **6** conforming to **7** to the requirements of carbon, and manganese, **9.3** and **10**' of IS 5986
ii)	Oxyacetylene blow-pipe resisting material	Copper conforming to IS 191 (Parts 1 to 10) or aluminium conforming to IS 736 or IS 737
iii)	Electrodes	*See* IS 814
iv)	Bolts	*See* IS 1364 (Part 1)
v)	Screws	*See* IS 1365
vi)	Painting	*See* **3.4** of IS 110 or **5.5** of IS 133 or **6.5** of IS 2932 or **3.4** of IS 6126

NOTE — The manufacturer is free to use any one or more of the applicable input raw materials.

the inner steel plate to resist an attack that enables removal of the TDR slab itself.

6.2.2 The outer slab shall be adequately welded to vestibule of 5 mm thickness. The inner slab/plate shall be adequately screwed to the vestibule frame.

6.2.3 The vestibule frame shall be of tubular type to suit the wall thickness and to be welded to outer slab. Provision shall be made at inner side for firmly screwing the inner slab/plate.

6.2.4 Alternatively vestibule frame shall be manufactured with two tubular frames sliding one into the other to suit wall thickness as specified in Table 1.

6.2.5 Outer frame shall be firmly welded to the outer slab. Inner frame shall be screwed/welded to the inner slab/plate.

6.3 Outer and inner slab/plate of the ventilator shall be perforated with holes not less than 19 mm diameter and not more than 40 mm diameter for easy flow of air. The total ventilating area in a typical ventilator unit shall be between 170 and 230 cm^2.

6.3.1 The ventilating holes shall be covered by means of stainless steel wire mesh or copper wire mesh from inside.

6.4 Minimum two baffle plates with minimum 50 mm overlap lined with minimum 5 mm thick fire insulating material, shall be fitted from inside to obstruct direct passage of flame in case of fire.

6.5 Provision shall be made for fixing the inner plate, from inside the vault (strong room). Further the inner slab/plate shall also be fixed to the wall with minimum 4 anchor bolts.

6.6 Air ventilators shall have provision for fixing exhaust/inlet fan.

7 BURGLARY RESISTANCE TEST

7.1 Terminology

7.1.1 900 cm^2 *Opening*

An opening with dimensions 30 cm × 30 cm.

7.1.2 *Common Hand Tools*

These include chisel, wrenches, screw drivers, pliers, hammers and sledge hammers not exceeding 3.5 kg in mass and pry bars and ripping tools not exceeding 1.68 m in length.

7.1.3 *Picking Tools*

These include common or standard patterns that are not designed for use against a specific make of ventilator.

7.1.4 *Impact Tools*

Includes portable electric or pneumatic impact hammers and hammer drills not exceeding 25.4 mm in diameter.

7.1.5 *Portable Electric Tools*

Electric hand drills accommodating drill bits not larger than 20 mm and coring drills. It includes carbide tipped drills and also portable abrasive cutting wheels.

7.1.6 *Power Saws*

These include circular saws not exceeding 200 mm in diameter, hole saws not exceeding 305 mm in diameter and reciprocating saws with a maximum blade length of 200 mm.

7.1.7 *Gas Cutting Torch*

A heavy-duty commercially available oxyacetylene 3.15 mm nozzle size length 90 cm to 135 cm with capacity to cut 30 cm of solid mild steel block. The quantity of gas consumed (combined total oxygen and fuel gas) in any one test shall be limited as follows:

For Class B Ventilator : 56 m^3
For Class A Ventilator : 112 m^3
For Class AA Ventilator : 224 m^3
For Class AAA Ventilator : 336 m^3

7.2 Net Working Time

7.2.1 As the object of the investigation is to arrive at conclusion as to the resistance of a ventilator to expert attack, the testing team, consisting of two skilled operators at a time may select a number of attacks within the scope of the test procedure and attempt each attack for the full-allotted time.

7.2.2 The net working time is to be understood to cover only the period during which an attack is actively in progress on the ventilator and is to be exclusive of preparation time for test and time required for safety precautions. The attack shall be in one continuous operation.

7.3 Sample for Testing

A single sample, known to be fully representative of a series of ventilators of similar design and construction, shall be subjected to test. Such sample shall be selected on the basis of random sampling by appropriate agency.

7.4 Cutting an Opening

An attempt shall be made to cut an opening of 900 cm^2 (*see* **7.1.1**) entirely through the ventilator (from outer slab/plate to inner slab/plate).

7.5 Criteria for Acceptance

7.5.1 *Class B Ventilator*

The ventilator shall resist entry when attacked continuously at a given point or area using the tools specified in **7.1.2** to **7.1.7** for a net working time (*see* **7.2.1** and **7.2.2**) of 20 min.

7.5.2 *Class A Ventilator*

The ventilator shall resist entry when attacked continuously at a given point or area using the tools specified in **7.1.2** to **7.1.7** for a net working time (*see* **7.2.1** and **7.2.2**) of 45 min.

7.5.3 *Class AA Ventilator*

The ventilator shall resist entry when attacked continuously at a given point or area using the tools specified in **7.1.2 to 7.1.7** for a net working time (*see* **7.2.1** and **7.2.2**) of 90 min.

7.5.4 *Class AAA Ventilator*

The ventilator shall resist entry when attacked continuously at a given point or area using the tools specified in **7.1.2** to **7.1.7** for a net working time (*see* **7.2.1** and **7.2.2**) of 120 min.

8 FINISH

8.1 All dents, burrs and sharp edges shall be removed from various components and they shall be thoroughly degreased, cleaned of rust and scale preferably by shot blasting or by normal pickling process.

8.2 All surfaces shall be phosphated or shot blasted before application of rust proof primer.

8.3 The painting shall be by minimum one coat of anti-corrosive primer followed by final paint.

8.4 Finish shall be smooth, uniformly applied, free from visible defects and shall not chip or flake easily.

9 MARKING

9.1 Air ventilators shall be marked with the manufacturer's name or trade-mark.

9.2 BIS Certification Marking

The air ventilators may also be marked with the Standard Mark.

9.2.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

10 INSPECTION

The purchaser or his representative shall normally have free access to inspect the air ventilator at various stages of manufacture.

11 PACKING

Each air ventilator shall be packed in accordance with the best trade practice.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Security Equipment Sectional Committee, ME 24

Organization	*Representative(s)*
Reserve Bank of India, Mumbai	Shri B. K. Katyal (***Chairman***) Shri K. Raghunathan (*Alternate*)
Bank of India, Mumbai	Shri S. Hariharan
Bharat Diamond Bourses, Mumbai	Shri Mehul N. Shah
Center for Environment and Explosive Safety (DRDO), New Delhi	Shri A. K. Kapoor Shri V. K. Chaudhary (*Alternate*)
Central Bank of India, Mumbai	Lt Col M. L. Kanaujia Capt S. Kannan (*Alternate*)
Central Building Research Institute, Roorkee	Dr T. P. Sharma Shri Suvir Singh (*Alternate*)
Chandan Metal Products Pvt Ltd, Vadodara	Shri Nitin P. Patni Shri G. D. Verma (*Alternate*)
General Insurance Corporation of India, Tariff Advisory Committee, Mumbai	Shri S. K. Chowdhary
Godrej and Boyce Mfg Co Ltd, Mumbai	Shri D. E. Byramjee Shri Ajit Nirvane (*Alternate*)
Loss Prevention Association of India Ltd, New Delhi	Shri D. K. Sarkar Shri T. P. Rao (*Alternate*)
Methodex Systems Ltd, New Delhi	Shri A. K. Verma Shri Sunil Wali (*Alternate*)
Punjab National Bank, New Delhi	Capt S. P. Singh Shri K. L. Jagga (*Alternate*)
Standard Chartered Bank, Mumbai	Lt Cdr Kishan Gopal
State Bank of India, Mumbai	Shri G. V. Chanana Shri S. D. Sumani (*Alternate*)
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Tata Consultancy Services, Mumbai	Shri Sanjay Bahl Shri R. K. Raghavan (*Alternate*)
The Gem and Jewellery Export Promotion Council, Kolkata	Shri Pankaj Kumar Parek
Union Bank of India, Mumbai	Brig S. Sreeramulu Capt E. Rajaram (*Alternate*)
BIS Directorate General	Shri A. S. Basu, Scientist 'F' & Head (MED) [Representing Director General (*Ex-officio Member*)]

Member Secretary
Shri P. Venkateswara Rao
Scientist 'E' (Director) (MED), BIS

Bureau of Indian Standards

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